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*Coleia boboi* n. sp. (Crustacea, Decapoda, Eryonoidea)  
from the Late Triassic (Rhaetian)  
of Monte Verzegnis (Udine, NE Italy)

**Abstract** - A sample of eryonoid decapod crustaceans were discovered on the N side of Monte Verzegnis (Udine, NE Italy), in the Calcare di Chiampomano, which is Late Triassic (Rhaetian) in age. The studied specimens are ascribed to *Coleia boboi* n. sp. (infraorder Palinura Latreille, 1803, family Coleiidae Van Straelen, 1924). The good state of preservation of the studied specimens permits recognition of sexual dimorphism in the superfamily Eryonoidea De Haan, 1841. In Italy *Coleia* Broderip, 1835, was previously known only from the Early Jurassic of Osteno (Lugano Lake, Como) by Pinna (1968, 1969) and Teruzzi (1990). Therefore, the new species is the oldest report of this genus in Italy.

**Key words:** Crustacea, Decapoda, Triassic, Italy.

**Riassunto** - *Coleia boboi* n. sp. (Crustacea, Decapoda, Eryonoidea) del Triassico superiore (Retico) del Monte Verzegnis (Udine, NE Italia).

Un campione di crostacei decapodi erionoidei è stato rinvenuto lungo il versante nord del Monte Verzegnis (Udine, NE Italia), nel Calcare di Chiampomano, datato al Triassico superiore (Retico). Gli esemplari studiati sono stati ascritti a *Coleia boboi* n. sp. (infraordine Palinura Latreille, 1803, famiglia Coleiidae Van Straelen, 1924). L'ottimo stato di conservazione degli esemplari studiati ha permesso di riconoscere la presenza di un dimorfismo sessuale nell'ambito della superfamiglia Eryonoidea De Haan, 1841. In Italia *Coleia* Broderip, 1835, era conosciuto finora solo dal Giurassico inferiore (Sinemuriano) di Osteno (Lago di Lugano, Como) grazie ai lavori di Pinna (1968, 1969) e Teruzzi (1990). La nuova specie rappresenta quindi la più antica testimonianza di questo genere in Italia.

**Parole chiave:** Crustacea, Decapoda, Triassico, Italia.

### Introduction and geological setting

The studied sample was discovered along the N side of Monte Verzegnis (Udine, NE Italy) in the Calcare di Chiampomano, which is Late Triassic (Rhaetian) in age (Fig. 1). The name "Calcare di Chiampomano", introduced by Carulli *et al.* (1994), and subsequently used by Ponton & Podda (1995), corresponds to the stratigraphic unit reported for the first time by Gortani (1910) and



Fig. 1 - Location of Monte Verzegnis (Ubicazione del Monte Verzegnis).

later by Gnaccolini & Martinis (1974) as “Unità B” along the sides of Monte Verzegnis. The Calcare di Chiampomano, composed of black limestones, 5-25 cm thick, is in contact with the Dolomia di Forni at the base, and with the Formazione di Soverzene above. The total thickness of the Calcare di Chiampomano is variable: from 400-500 metres (Monte Verzegnis, Monte Rest) to zero near the platform (Monte Costa di Paladin). The pollen assemblage with *Corollina torosus*, *Retritiletes semimuris*, *Lycopodiumsporites austroclavatoides*, *Trachysporites fuscus*, *Aurocariacites* sp., and *Lycopodiocites* sp. discovered at the base of the unit in the Rio Secco, northern side of the Monte Verzegnis, permitted dating the Calcare di Chiampomano as Rhaetian (Late Triassic). Corsi (1964) ascribed the same age to it by the discovery of *Dimyodon intusstriatum*, present in the coeval Calcare di Dachstein. Dalla Vecchia (1996) suggested that the beds of the Calcare di Chiampomano could be Sevatian in age (late Norian).

The faunal assemblage of the Calcare di Chiampomano includes rare and incomplete, poorly preserved fishes, coprolites, echinoids, ofiuroids, probably traces of worms, ammonites, such as *Choristoceras* (Mietto, work in progress), and decapods (penaeids, erymids, glypheoids, and coleoids). Among the decapods, only the specimens belonging to the family Coleiidae Van Straelen, 1924, are well-preserved enough to justify their description, which is the subject of the present paper.

### Fossil record of *Coleia* Broderip, 1835

Broderip (1835) described *Coleia* based upon two specimens from the Early Jurassic (Sinemurian) of Lyme Regis (Great Britain) with *C. antiqua* Broderip, 1835, as the type species.

*Coleia* Broderip, 1835 (family Coleiidae Van Straelen, 1924) is reported in the Late Triassic of Japan, in the Early Jurassic of Europe (Germany, Great Britain, France, Russia, and Italy) and India, and in the Late Jurassic of Madagascar.

*Coleia* Broderip, 1835, includes today the following species: *Coleia uzume* Karasawa et. al., 2003, *C. antiqua* Broderip, 1835, *C. barrovensis* (McCoy, 1849), *C. longipes* (Fraas, 1855), *C. escheri* (Oppel, 1862), *C. edwardsi* (Morière, 1864), *C. wilmcotensis* (Woodward, 1866), *C. moorei* (Woodward, 1866), *C. brodei* (Woodward, 1866), and *C. crassichelis* (Woodward, 1866), *C. morierei* (Renault, 1889), *C. tenuichelis* Woods, 1925, and *C. bredonensis* Woods, 1925, *C. sinuata* Beurlen, 1928, *C. sibirica* Chernyshev, 1930, *C. theodorii* Kuhn, 1952, *C. viallii* Pinna, 1968, *C. mediterranea* Pinna, 1968, *C. pinnai* Teruzzi, 1990, *C. popeyei* Teruzzi, 1990, and *C. incerta* Secretan, 1964 (Broderip, 1835; McCoy, 1849; Fraas, 1855; Oppel, 1862, Morière, 1864; Woodward, 1866; Renault, 1889; Woods, 1925; Beurlen, 1928; Chernyshev, 1930; Kuhn, 1952; Secretan, 1964; Pinna, 1968, 1969; Teruzzi, 1990; Karasawa, 2003). Feistamel (1877) reported one incomplete specimen from the Early Jurassic of India, comparing it with *C. barrovensis*.

### Material

The studied specimens, preserved in a brown limestone, are flattened on the bedding surface and preserved in ventral view, apart the holotype which is in dorsal view. Their preparation was made easy as a result of the softness of the surrounding rock.

The studied specimens (47 in all) were assigned to *Coleia* Broderip, 1835 (infraorder Palinura Latreille, 1803, family Coleiidae Van Straelen, 1924) with *C. boboi* n. sp., designated the type species.

**Acronym.** MFSN: Museo Friulano di Storia Naturale, Udine.

### Systematic Palaeontology

Superfamily Eryonoidea De Haan, 1841

Family Coleiidae Van Straelen, 1924

Genus *Coleia* Broderip, 1835

*Coleia boboi* n. sp.

Figs. 2-6

**Diagnosis:** subvoid carapace, with two strong and elongate supraorbital spines; two thin postorbital carinae; thin median postcervical carina; two thin branchial carinae; deep cervical groove; deep cervical and postcervical incisions dividing margin into three parts; chela of pereopod I with movable and fixed fingers gently bent at the distal extremity and similar in length; subtriangular telson with two strong tuberculate lateral carinae and spiny lateral margins; rounded uropodal exopod with diaeresis.

**Etymology:** from the nickname of R. Rigo who reported for the first time the presence of coleoids from Monte Verzegnis.



**Holotype:** MFSN 29011 a-b.

**Paratypes:** MFSN 29006, 29024, 29030 a-b, 29042, 29044 a-b.

**Stratigraphic range:** Late Triassic (Rhaetian).

**Type locality:** Monte Verzegnis (Udine, NE Italy).

**Occurrence and measurements:** 47 specimens (14 preserved in part and counter-part). The female has a size from 3 to 4.5 cm, while the male from 6 to 7 cm.

MFSN: from 28996 to 29014, from 29016 to 29021 a-b, from 29023 a-b to 29031 a-b, from 29033 to 29045.

**Description.** Elongate coleoid with densely tuberculate exoskeleton.

**Carapace.** Subovoid carapace, longer than wide. Narrow frontal margin without rostrum and with two strong and elongate supraorbital spines. Small and narrow ocular incisions. Two thin postorbital carinae. Deep cervical and postcervical incisions dividing margin into three parts. Deep cervical groove. Thin tuberculate median postcervical carina. Two thin and tuberculate branchial carinae. Spiny lateral margins of carapace. Posterior margin slightly concave. Dorsal surface of carapace densely tuberculate.

**Abdomen.** Subrectangular somite I smaller than the others. Subrectangular somites II-VI of equal length, narrowing posteriorly. Tergites and pointed pleurae of somites II-VI finely tuberculate. Somites I-V with a strongly raised tergal carina. Triangular telson with two tuberculate lateral carinae, pointed distal extremity and spiny lateral margins. Subsquares protopodite. Subrounded uropodal endopod with a strong median longitudinal carina. Subrounded uropodal exopod with diaeresis and with a strong median longitudinal carina (Fig. 2).

**Cephalic appendages.** Thin antennular peduncles of which the distal one carries two short multiarticulate flagella of equal length. Short and stout antennal pedun-



Fig. 2 - *Coleia boboi* n. sp., n. cat. MFSN i29045, detail of the tail fan (dettaglio del ventaglio caudale) (x 3).

cles of which the distal one carries a thin multiarticulate flagellum. Petaloid scaphocerite with pointed distal extremity and spiny outer margin.

Thoracic appendages. The studied specimens show two different kinds of chelae on pereopod I: one chela with elongate and thin propodus and one with strong and stout propodus (Fig. 3). The presence of these two kind of chela could be attributed to sexual dimorphism of the studied specimens (see discussion). Both types of chelae of pereopod I with movable and fixed fingers gently curved



Fig. 3 - *Coleia boboi* n. sp.: a) MSNM i29006, chela of pereopod I of male (chela del pereopode I del maschio) (x 2); b) MSNM i29042, chela of pereopod I of female (chela del pereopode I della femmina) (x 3).



at the distal extremity, same in length and with edentate inner margins. Thin lateral carina extends the total length of propodus. Spiny margins on propodus. Outer margin of movable finger partially spiny. Surface of merus, carpus, propodus, movable and fixed fingers slightly tuberculate. Pereiopods II-IV with small chelae of equal length. Spiny upper and lower margins of merus, carpus and propodus of pereiopods II-IV. Pereiopods V shorter than others, achelate and spineless.

Abdominal appendages. Pleopods with an unsegmented peduncle which carries two elongate multiarticulate flagella. Pleopods of somite I modifies in elongate and thin petasma (MFSN 29012, 29016) in the male.

**Possible sexual dimorphism in *Coleia boboi* n. sp.** As already seen, *Coleia boboi* n. sp. can be separated into two groups on the basis of the different morphology of the chelae of pereiopod I (Fig. 3): one group with elongate and thin propodus and one with strong and stout propodus, both with movable and fixed fingers of the same length and curved at the distal extremity. There are basically four preliminary assumptions aimed at explaining such a difference:

the possibility that the differences could be ascribed to a certain degree of intraspecific variability;

the possibility that the specimens could present different ontogenetic stages, during which a progressive modification of the chela took place;

the possibility that two different species were present in the studied sample;

the possibility that the differences could be ascribed to a sexual dimorphism.

The last assumption seems the most probable. In fact, the presence of petasma in two specimens (MFSN 29012, 29016) (Fig. 4) allows identification of the specimens with strong and stout propodus of chela of pereiopod I as male, and the specimens with elongate and thin propodus of chela of pereiopod I as female.

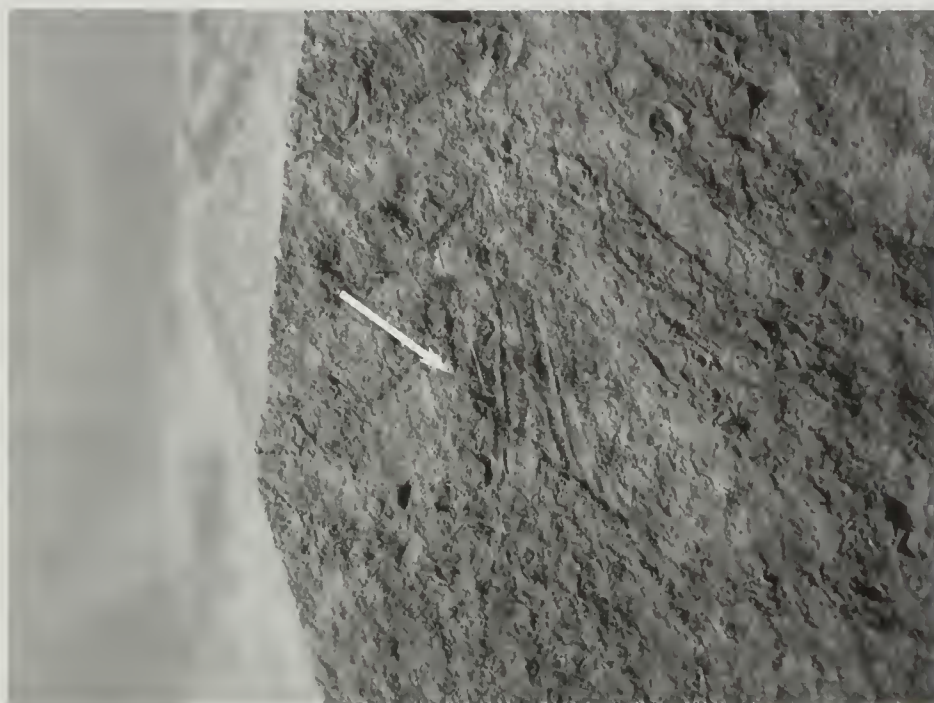


Fig. 4 - *Coleia boboi* n. sp., n. cat. MFSN i29016, detail of petasma (dettaglio del petasma) (x 4).

Recently Schweigert (2001) reported a dimorphism in *Cycleryon* Glaessner, 1945, in which the males and females are distinguished on the basis of the different shape of the chelae. Moreover Forest & de Saint Laurent (1981, 1989) pointed out that in the living glypheid *Neoglypheia inopinata*, sexual dimorphism affects the lengths of pereopod I and its segments, with the longer ones developed in the female. These observations could confirm the hypothesis of sexual dimorphism in *Coleia boboi* n. sp.

**Discussion.** The studied specimens are ascribed to *Coleia* Broderip, 1835, on some morphological characters, following the emended diagnosis by Karasawa *et al.* (2003): subovoid carapace, longer than wide; supraorbital spines; two deep marginal incisions; postorbital carinae present; deep cervical groove; median postcervical carina and branchial carinae present; terga of abdominal somites with median tergal carina; pleura of somite II-VI well-developed; triangular telson; sub-

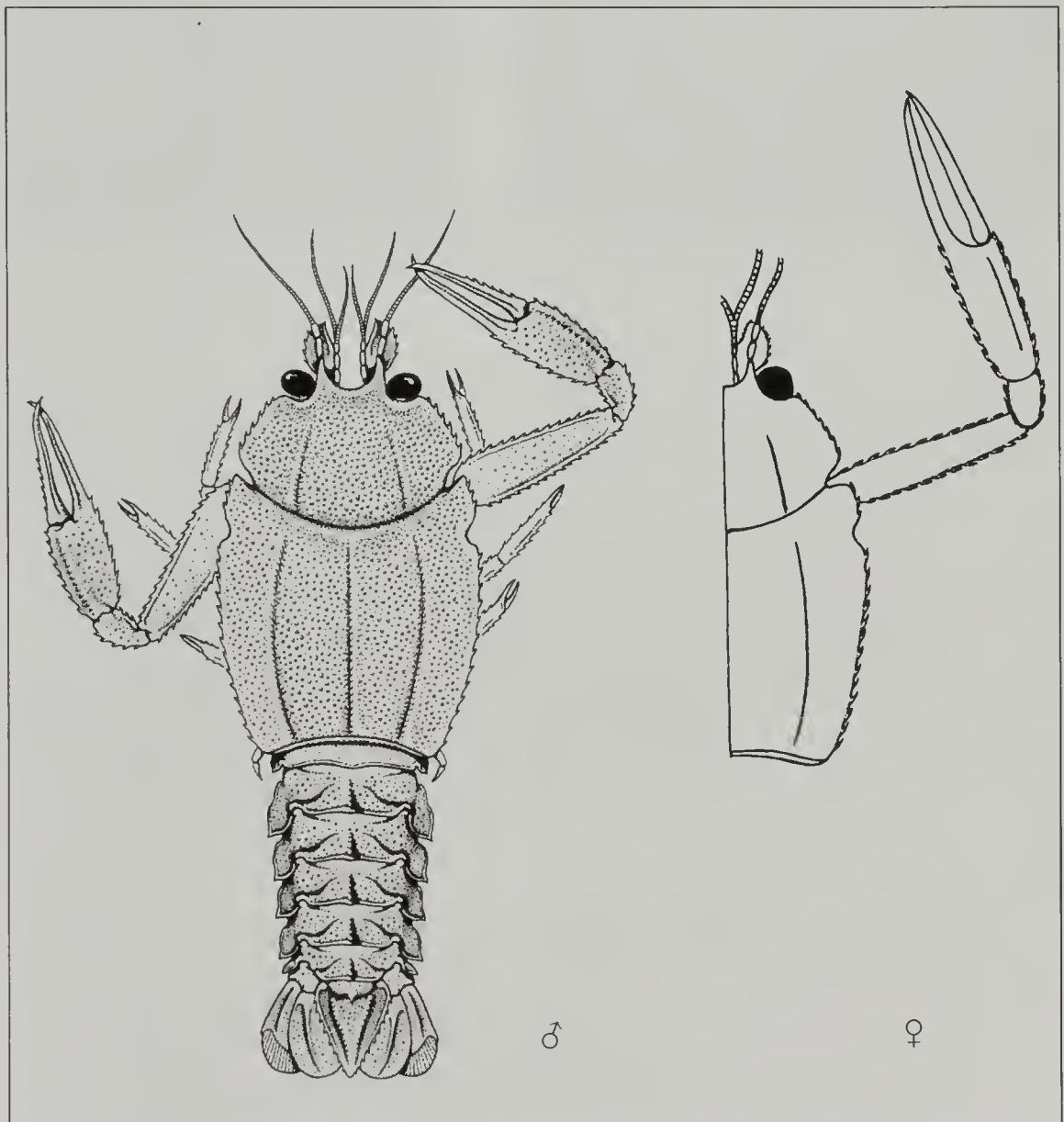


Fig. 5 - *Coleia boboi* n. sp., reconstruction (ricostruzione); ♂: male (maschio); ♀: female (femmina).

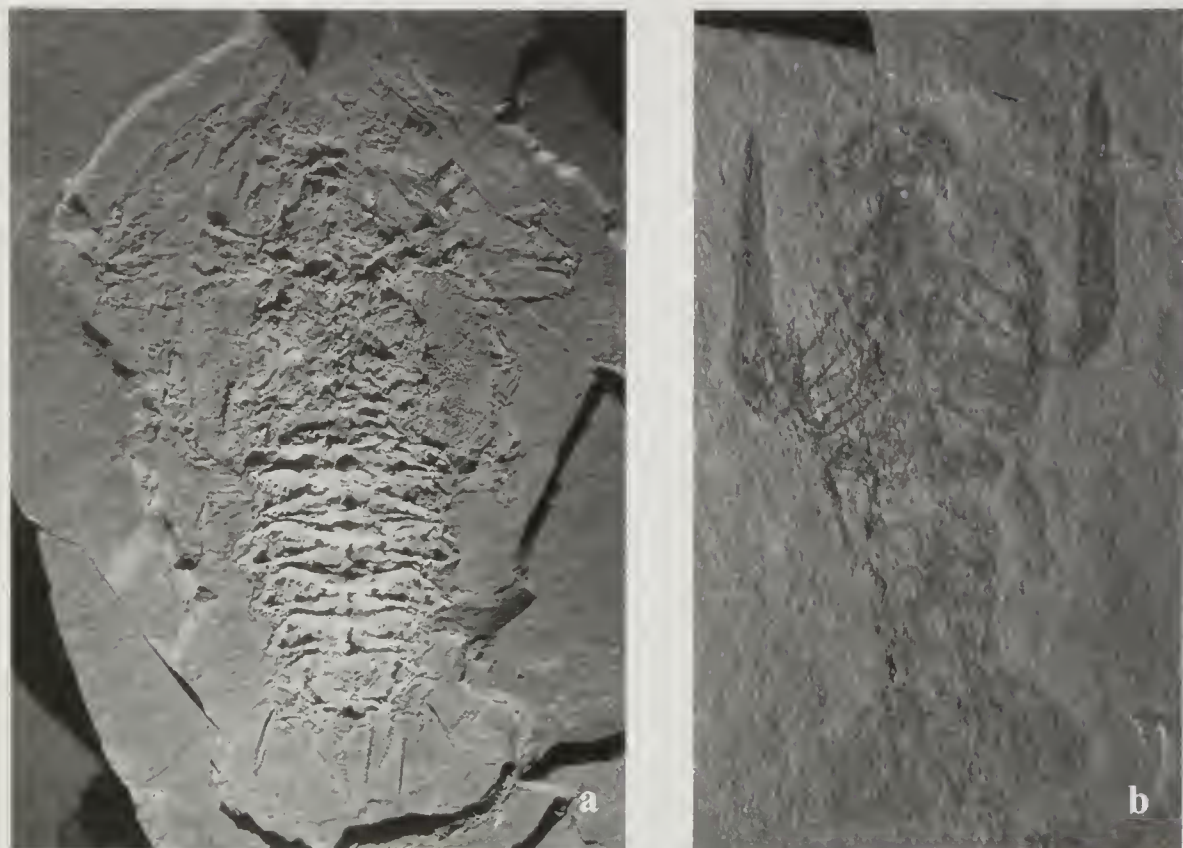


Fig. 6 - *Coleia boboi* n. sp. a) Holotype (olotipo), n. cat. MFSN i29011, natural size (grandezza naturale); b) Paratype (paratipo), n. cat. MFSN i29044 (x 1.5).

rounded uropodal endopod and exopod; uropodal exopod with subrounded diarexis; pereopod I usually slender and elongate; pereopods I-IV chelate.

The studied specimens show some morphological characters, such as two elongate and strong supraorbital spines, narrow frontal margin, two thin postorbital carinae, pointed pleurae of somites II-VI, and spiny lateral margins of telson, not present in the other species of *Coleia* known to date in order to justify the institution of the new species *Coleia boboi* from the Late Triassic (Rhaetian).

The discovery of *Coleia boboi* n. sp. extends the stratigraphic range of *Coleia* in Italy, known to date only from the Early Jurassic (Sinemurian) of Osteno (Lugano Lake, Como, N Italy) with four species: *C. viallii* Pinna, 1968, *C. mediterranea* Pinna, 1968, *C. pinnai* Teruzzi, 1990, and *C. popeyei* Teruzzi, 1990.

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